

Amendments to the Claims

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~strikethrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered). The following listing of claims replaces all prior versions, and listings, of claims in the present application.

Please AMEND claims 1, 3-8, 10-15, and 17-19 in accordance with the following:

1. (Currently Amended) An optical transmission method, using Raman amplification to transmit a wavelength division multiplexed signal light including a plurality of optical signals of different wavelengths among a plurality of optical transmission apparatuses and supplying a pumping light to a Raman amplification medium existing on an optical transmission path, to Raman amplify the wavelength division multiplexed signal light being propagated through the Raman amplification medium,

wherein a supervisory signal transferred among said plurality of optical transmission apparatuses is selectively superimposed on the pumping light supplied to said Raman amplification medium, and

wherein when a plurality (m) of pumping lights of different wavelengths are supplied to said Raman amplification medium, said supervisory signal is selectively superimposed on at least one of 1 through (m-1) of said plurality of pumping lights of different wavelengths.

2. (Cancelled)

3. (Currently Amended) ~~An optical transmission~~ The method of using Raman amplification according to claim 1, wherein the at least one of the 1 through (m-1) pumping light to be lights on which the supervisory signal is superimposed with said supervisory signal is selected out of said plurality of pumping lights based on a loss wavelength characteristic of said optical transmission path.

4. (Currently Amended) ~~An optical transmission~~ The method using Raman amplification according to of claim 3, wherein the at least one of the 1 through (m-1) pumping light to be lights on which the supervisory signal is superimposed with said supervisory signal is selected out of said plurality of pumping lights so that a the signal loss of said optical

~~transmission path~~ in a Raman gain band corresponding to a wavelength of ~~said the one of the~~ the one of the pumping light ~~becomes lights is less smaller~~ than the loss of ~~said the~~ optical transmission path corresponding to a wavelength of each of the other others of the 1 through (m-1) pumping light lights.

5. (Currently Amended) ~~An optical transmission~~ The method using Raman amplification according to ~~of claim 1, wherein a part of the Raman amplified wavelength division multiplexed signal light input to said optical transmission apparatus through said optical transmission path is led directed~~ to an optical filter having a passing band in a Raman gain band corresponding to a wavelength of the at least one of the 1 through (m-1) pumping light superimposed lights with said on which the supervisory signal is superimposed, to detect ~~said the~~ the supervisory signal using a light passing through ~~said the~~ the optical filter.

6. (Currently Amended) ~~An optical transmission~~ The method using Raman amplification according to ~~of claim 1, wherein the supervisory signal transmitted from a previous stage optical transmission apparatus is detected to superimpose and a suppression signal to suppress said the detected supervisory signal on the a pumping light corresponding to the at least one of the 1 through (m-1) pumping light lights on which the supervisory signal is superimposed with the supervisory signal from said the previous stage optical transmission apparatus, among the pumping lights of different wavelengths to be supplied to said Raman amplification medium.~~

7. (Currently Amended) ~~An optical transmission~~ The method using Raman amplification according to ~~of claim 6, wherein the supervisory signal to be sent to a succeeding stage optical transmission apparatus is superimposed on the at least one of the 1 through (m-1) pumping light lights different from the pumping light superimposed with the suppression signal lights on which the suppression signal is superimposed.~~

8. (Currently Amended) An optical transmission system using Raman amplification comprising:

a plurality of optical transmission apparatuses to transmit a wavelength division multiplexed signal light including a plurality of optical signals of different wavelengths, and
a Raman amplifier to Raman amplify the wavelength division multiplexed signal light

being propagated through a Raman amplification medium by supplying a pumping light to said Raman amplification medium existing on an optical transmission path,

wherein said Raman amplifier includes a supervisory signal superimposing section to selectively superimpose a supervisory signal transferred among said plurality of optical transmission apparatuses on the pumping light supplied to said Raman amplification medium,

wherein said Raman amplifier has a plurality of pumping light sources generating which generate a plurality (m) of pumping lights of different wavelengths, and

wherein said supervisory signal superimposing section selectively superimposes said supervisory signal on at least one of 1 through (m-1) of said plurality of pumping lights of different wavelengths supplied to said Raman amplification medium from said respective pumping light sources.

9. (Cancelled)

10. (Currently Amended) ~~An~~ The optical transmission system ~~using Raman amplification according to~~ of claim 8, wherein said ~~the~~ the supervisory signal superimposing section selects the at least one of the 1 through (m-1) pumping light ~~to be~~ lights on which the supervisory signal is superimposed with said supervisory signal ~~is selected out of said plurality of pumping lights based on a loss wavelength characteristics~~ characteristic of said ~~the~~ optical transmission path.

11. (Currently Amended) ~~An~~ The optical transmission system ~~using Raman amplification according to~~ of claim 8, wherein said ~~the~~ the supervisory signal superimposing section selects the at least one of the 1 through (m-1) pumping light ~~to be~~ lights on which the supervisory signal is superimposed with said supervisory signal so that a loss of said ~~the~~ optical transmission path in a Raman gain band corresponding to a wavelength of said ~~the~~ pumping light becomes relatively small.

12. (Currently Amended) ~~An~~ The optical transmission system ~~using Raman amplification according to~~ of claim 8, wherein said ~~the~~ the optical transmission apparatus has sending terminal comprises an optical coupler ~~for branching~~ which branches a part of the Raman amplified wavelength division multiplexed signal light sent from said ~~the~~ optical transmission path, an optical filter ~~input with a~~ which receives the branched light from said ~~the~~

optical coupler and having a passing band in a Raman gain band corresponding to a wavelength of the at least one of the 1 through (m-1) pumping light lights on which the supervisory signal is superimposed with said the supervisory signal, and a supervisory signal detecting section for ~~detecting said~~ which detects the supervisory signal using a light passing through said the optical filter.

13. (Currently Amended) ~~An~~ The optical transmission system using Raman amplification ~~according to of~~ claim 8, wherein when a plurality of said Raman amplifier ~~amplifiers~~ are provided ~~corresponding to respective repeating areas among said plurality of optical transmission apparatuses, said and~~ each Raman amplifier includes a suppression signal superimposing section for ~~superimposing~~ which superimposes a suppression signal to suppress the supervisory signal from a previous stage optical transmission apparatus detected at the corresponding optical transmission apparatus on the pumping light corresponding to the at least one of the 1 through (m-1) pumping light lights on which the supervisory signal is superimposed with the supervisory signal, among the pumping lights of different wavelengths to be supplied to said Raman amplification medium.

14. (Currently Amended) An optical transmission system using Raman amplification according to claim 13, wherein said the supervisory signal superimposing section of each Raman amplifier superimposes the supervisory signal to be sent to a succeeding stage optical transmission apparatus on the a pumping light different from the at least one of the 1 through (m-1) pumping light lights on which the suppression signal is superimposed with the suppression signal.

15. (Currently Amended) A Raman amplifier comprising:
a pumping light generating section to generate a pumping light; and
a multiplexer to supply the pumping light from said pumping light generating section to a Raman amplification medium, to Raman amplify a wavelength division multiplexed light being propagated through said Raman amplification medium,

wherein said Raman amplifier includes a supervisory signal superimposing section to selectively superimpose a supervisory signal transferred among said plurality of optical transmission apparatuses to transmit said wavelength division multiplexed light on the pumping light supplied to said Raman amplification medium from said pumping light generating section

via said multiplexer,

wherein said Raman amplifier has a plurality of pumping light sources ~~generating~~ which generate a plurality (m) of pumping lights of different wavelengths, and

wherein said supervisory signal superimposing section selectively superimposes said supervisory signal on at least one of 1 through (m-1) of said plurality of pumping lights of different wavelengths supplied to said Raman amplification medium from said respective pumping light sources via said multiplexer.

16. (Cancelled)

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17. (Currently Amended) A Raman amplifier according to claim 17, wherein said the Raman amplifier includes a suppression signal superimposing section ~~for superimposing~~ which superimposes a suppression signal to suppress the supervisory signal from a previous stage optical transmission apparatus on the pumping light corresponding to the at least one of the 1 through (m-1) pumping light lights on which the supervisory signal is superimposed ~~with the supervisory signal from said the previous stage optical transmission apparatus, among the pumping lights of different wavelengths to be supplied to said Raman amplification medium from said respective pumping light sources via said multiplexer.~~

18. (Currently Amended) A Raman amplifier according to claim 17, wherein said the supervisory signal superimposing section superimposes the supervisory signal to be sent to a succeeding stage optical transmission apparatus on ~~the~~ a pumping light different from the pumping light superimposed with the suppression signal.

19. (Currently Amended) A method of Raman amplifying a wavelength division multiplexed signal light, comprising:

providing a wavelength division multiplexed signal light including a plurality of optical signals of different wavelengths through a transmission path including a Raman amplification medium disposed thereon;

supplying a plurality (m) of pumping lights of different wavelengths to a the Raman amplification medium ~~existing on the optical transmission path~~ to Raman amplify ~~the~~ a wavelength division multiplexed signal light propagating through the Raman amplification medium; and

selectively superimposing a supervisory signal on at least one of 1 through (m-1) of said plurality of pumping lights.

20. (New) The method of claim 19, wherein the at least one of the 1 through (m-1) pumping lights on which the supervisory signal is superimposed is selected out of said plurality of pumping lights based on a loss wavelength characteristic of said optical transmission path.

21. (New) An optical transmission method, comprising:
transmitting a wavelength division multiplexed signal light having a plurality of optical signals of different wavelengths along an optical transmission path that includes a Raman amplification medium;
amplifying wavelength division multiplexed signal light propagating through the Raman amplification medium by supplying a plurality of pumping lights of different wavelengths to the Raman amplification medium and selectively superimposing a supervisory signal onto one of the plurality of pumping lights based on a loss wavelength characteristic of the optical transmission path.

22. (New) The method of claim 21, wherein the one of the pumping lights has less loss in the Raman gain band than the other pump lights of the plurality of pump lights.

23. (New) An optical transmission system comprising:
an optical sending terminal which transmits a wavelength division multiplexed signal light having a plurality of optical signals of different wavelengths; and
a Raman amplifier which Raman amplifies the wavelength division multiplexed signal light propagating through a Raman amplification medium disposed along the optical transmission path by supplying a pumping lights to the Raman amplification medium, the Raman amplifier including a pumping light generating section generating a plurality of pumping lights of different wavelengths and a supervisory signal superimposing section which selectively superimposes a supervisory signal onto one of the plurality of pumping lights based on a loss wavelength characteristic of the optical transmission path.

24. (New) The method of claim 23, wherein the one of the pumping lights has less loss in the Raman gain band than the other pump lights of the plurality of pump lights.

25. (New) A Raman amplifier comprising:
a pumping light generating section which generates a pumping light; and
a multiplexer which supplies the pumping light to a Raman amplification medium in which
a wavelength division multiplexed light propagating therethrough is Raman amplified,
a supervisory signal superimposing section which selectively superimposes a
supervisory signal onto one of the plurality of pumping lights based on a loss wavelength
characteristic of the optical transmission path.

26. (New) The method of claim 25, wherein the one of the pumping lights has less
loss in the Raman gain band than the other pump lights of the plurality of pump lights.

27. (New) A method comprising:
transmitting a wavelength division multiplexed (WDM) signal light through an optical
transmission line, the WDM optical signal including optical signals at different wavelengths
multiplexed together;
supplying pump light to the transmission line so that the WDM signal light is amplified by
Raman amplification as the WDM signal light travels through the transmission line; and
superimposing supervisory information onto the pump light so that, as the pump light
travels through the transmission line, the supervisory information becomes superimposed on a
respective optical signal of the WDM signal light.

28. (New) The method of claim 27, further comprising: detecting the supervisory
information superimposed on the respective optical signal by a downstream apparatus.

29. (New) An apparatus comprising:
an optical transmitter transmitting a wavelength division multiplexed (WDM) signal light
through an optical transmission line, the WDM optical signal including optical signals at different
wavelengths multiplexed together;
means for supplying pump light to the transmission line so that the WDM signal light is
amplified by Raman amplification as the WDM signal light travels through the transmission line;
and
means for superimposing supervisory information onto the pump light so that, as the

pump light travels through the transmission line, the supervisory information becomes superimposed on a respective optical signal of the WDM signal light.

30. (New) A method comprising:

transmitting a wavelength division multiplexed (WDM) signal light through an optical transmission line, the WDM optical signal including optical signals at different wavelengths multiplexed together;

supplying a plurality of pump lights at different wavelengths to the transmission line so that the WDM signal light is amplified by Raman amplification as the WDM signal light travels through the transmission line; and

superimposing supervisory information onto a respective pump light of the plurality of pump lights so that, as the respective pump light travels through the transmission line, the supervisory information becomes superimposed on a respective optical signal of the WDM signal light in accordance with the wavelength of the respective pump light and the wavelength of the respective optical signal.

31. (New) The method of 30, wherein the respective pump light is selected from the plurality of pump lights so that a loss of the transmission line in a Raman gain band corresponding to the wavelength of the respective pump light is smaller than losses of the transmission line corresponding to wavelengths of the other pump lights.

32. (New) An apparatus comprising:

means for transmitting a wavelength division multiplexed (WDM) signal light through an optical transmission line, the WDM optical signal including optical signals at different wavelengths multiplexed together;

means for supplying a plurality of pump lights at different wavelengths to the transmission line so that the WDM signal light is amplified by Raman amplification as the WDM signal light travels through the transmission line; and

means for superimposing supervisory information onto a respective pump light of the plurality of pump lights so that, as the respective pump light travels through the transmission line, the supervisory information becomes superimposed on a respective optical signal of the WDM signal light in accordance with the wavelengths of the respective pump light and the respective optical signal.

B1/Cancelled

33. (New) The apparatus of claim 32, wherein the respective pump light is selected from the plurality of pump lights so that a loss of the transmission line in a Raman gain band corresponding to the wavelength of the respective pump light is smaller than losses of the transmission line corresponding to wavelengths of the other pump lights.
